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| APPLICATION NO.                        | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/516,530                             | 12/02/2004  | Chong Hak Tay        | 743459-20           | 4495             |
| 22204                                  | 7590        | 04/05/2007           | EXAMINER            |                  |
| NIXON PEABODY, LLP                     |             |                      | SERGENT, RABON A    |                  |
| 401 9TH STREET, NW                     |             |                      | ART UNIT            |                  |
| SUITE 900                              |             |                      | PAPER NUMBER        |                  |
| WASHINGTON, DC 20004-2128              |             |                      | 1711                |                  |
| SHORTENED STATUTORY PERIOD OF RESPONSE |             | MAIL DATE            | DELIVERY MODE       |                  |
| 3 MONTHS                               |             | 04/05/2007           | PAPER               |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

|                              |                 |                  |
|------------------------------|-----------------|------------------|
| <b>Office Action Summary</b> | Application No. | Applicant(s)     |
|                              | 10/516,530      | TAY, CHONG HAK - |
| Examiner                     | Art Unit        |                  |
| Rabon Sergent                | 1711            |                  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on \_\_\_\_\_.  
 2a) This action is FINAL. 2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-35 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_ is/are allowed.  
 6) Claim(s) 1-35 is/are rejected.  
 7) Claim(s) \_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 02 December 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

|   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/2/05, 5/6/05, 10/27/05</u> | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|   | 6) <input type="checkbox"/> Other: _____                          |

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1. Claims 1-9, 12, 13, 15, 16, 19-30, 33, and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 1, it is unclear what internal surfaces are being referred to.

With respect to claims 3, 5, and 19, it is unclear what degree of filling or encapsulation is denoted by the language, "at least substantially fills" and "at least substantially encapsulated". In other words, what quantitative degree of unfilled or nonencapsulated may be present and still satisfy the claims?

With respect to claim 6, it is unclear if the claimed particles refer to those prior to being coated with the fire resistant material.

With respect to claims 12 and 13, it is unclear what extent constitutes a "sufficient extent". At what point is drying or setting sufficient?

With respect to claim 13, the use of the word, "mound", appears to be improper.

With respect to claims 15 and 16, the term, "free-flowing loose fill", is relative language. It is unclear how flowable a component must be in order to be considered "free-flowing".

With respect to claim 16, it is unclear what process step is being set forth by the "... and with a binder material ...".

With respect to claim 20, the use of "can" renders the claims indefinite, because it is unclear if or too what extent the insulation material is in fact required to be fire resistant.

With respect to claims 22-30, it is unclear which "insulation material" is being referred to within claim 10.

With respect to claim 24, the language, "... with layers at least of ...", cannot be clearly understood.

With respect to claim 25, it is unclear how the subject matter of the claim relates to the layer requirement set forth within claim 24.

With respect to claim 33, it is unclear what criteria must be satisfied in order for the material to be suitable for structural applications.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5, 7, 9-11, 15-17, 20, 22, 23, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Stark, Jr. ('485).

Patentee discloses the production of fire resistant articles, such as insulation boards, by coating polystyrene particles, which may be obtained from scrap materials, with water glass, which acts as a binder. The water glass meets applicant's intumescence material limitation, since the water glass is disclosed as containing sodium silicate. See abstract; column 3, line 19 through column 5, line 49; and column 7, lines 1-27. Furthermore, patentee discloses varying

the amount of water glass on the particles at column 4, lines 26+; therefore, the limitations of claim 23 are considered to be met.

4. Claims 1-7, 9-11, 17, 20, 22, 23, and 31-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Illger et al. ('559).

Patentees disclose the impregnation of open-cell polyurethane foams with a fire retarding dispersion consisting of aluminum hydroxide, a polyurethane latex, an alumino-silicate, and surface active substances. Patentees further disclose that when the polyurethane foam is in the form of flakes or polyurethane foam waste, the resulting impregnated foam composition may be subjected to shaping operations to produce molded articles, flat products, etc. See abstract; column 2, lines 9+; column 3, lines 28-33; and columns 5 and 6. Lastly, at column 6, lines 8-19, patentees disclose that other flame retarding compounds such as those that promote carbonization may be utilized; the position is taken that this disclosure satisfies applicant's intumescent limitation.

5. Claims 1, 2, and 31-35 are rejected under 35 U.S.C. 102(b) as being anticipated by De Keyser ('559).

Patentee discloses the coating of outer and inner surfaces of polymeric materials, including polyurethane foams, with fire retardant intumescent materials. Applicant's disclosure that foams may be coated and that inner surfaces are preferably coated indicates that open cell foams are contemplated by the reference. See abstract; column 3, lines 33+; and column 4, lines 17+.

6. Claims 1, 3-8, 10, 11, 17, 20-23, 29, 30, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Moses et al. ('701).

Patentees disclose the production of building panels wherein a settable core material, comprising cement, sand, and polystyrene particles, is sandwiched between two facing panels. See abstract; column 5, lines 16+; column 6, lines 4-9. The position is taken that the cement component meets applicant's fire resistant coating and binding material, the sand meets applicant's different particle and incombustible material requirement of claim 30, and the disclosure of reinforcing mesh at column 6 meets applicant's fiber reinforcement of claim 8.

7. Claims 1-3, 5, 7, 10, 11, 14-23, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by DE 3115456.

The reference discloses the production of composite building panels, wherein foamed plastic particles, such as polystyrene beads, are coated with a fire resistant coating, such as a silicate, considered to meet applicant's intumescent material; the resulting coated particles are then mixed with a foamable polyurethane composition; the resulting composition then foams and cures between facing layers, such as foil. See abstract.

8. Claims 1-7, 10, 11, 17, 20-23, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by DE 19910257.

The reference discloses the production of sandwich laminate insulating material, wherein foamed particles, such as polystyrene, are coated with a binder, such as phenolic resin, and a fire resistant material, such as expanded graphite. See column 3, lines 49-67 and examples.

9. Claims 1, 2, and 31-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Blount ('281).

Patentee discloses the coating of the cell walls of an open cell foam with a liquid that contains a fire retardant intumescent component. See abstract and columns 2 and 3.

10. Claims 1, 3-5, 7, 10, 11, 17, 20, 22, 23, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 224,945.

The reference discloses the production of composite foamed insulation materials, wherein foamed polyurethane is produced comprising polytetrafluoroethylene particles and flame retardant. See abstract, pages 2 and 3, and examples.

11. Claims 1, 2, and 31-35 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 942,107.

The reference discloses the production of fire resistant foam cores, wherein foam is impregnated with a flame retardant composition. See abstract.

12. Claims 1-5, 7, 10, 15, 16, 22, 23, 29, 30, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Annemaier et al. ('763).

Patentees disclose the production of fireproofing material, wherein particles of polyurethane foam and polyethylene foam are mixed with intumescent flame retardant materials and resins that serve as binders. See abstract and example 1.

13. Claims 1, 3-5, 7, 10, 11, 13, 15-20, 22, 23, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Shannon ('196).

Patentee discloses that polystyrene beads (particles) or other synthetic resin particles may be coated with a cement material to yield discreet coated particles. Patentee further discloses that the polymer particles may be combined with the cement material to form a continuous or integral board. See column 1, line 42 through column 3, line 15. Additionally, patentee discloses the production of an integral board wherein the dried or hardened coated particles are further mixed with a binder or adhesive and then cured. It is disclosed that the adhesive or

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binder may be the same as the one used to coat the particles. See column 3, lines 16-25. The position is taken that the cement material satisfies applicant's fire resistant material.

14. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shannon ('196).

As aforementioned within paragraph 13, patentee discloses the production of an integral board wherein the dried or hardened coated particles are further mixed with a binder or adhesive and then cured. It is disclosed that the adhesive or binder may be the same as the one used to coat the particles. See column 3, lines 16-25. Though patentee discloses that the particle coating is hardened prior to combining with the adhesive or binder, the position is taken that it would have been obvious to simply mix the wetted or pre-hardened particle with the binder or adhesive composition, especially when the coating material and the adhesive or binder material are the same. Such a practice would have been beneficial due to cost-savings or time-savings, and one of ordinary skill would have expected the same final product to result.

15. Claims 1-5, 7, 10, 11, 17, 20-23, 29, 30, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Stastny et al. ('840).

Patentees disclose the production of fire resistant articles, such as insulation boards, by coating polystyrene particles with alkali metal silicate, which acts as a binder. The alkali metal silicate meets applicant's intumescent material limitation. See abstract; column 2, lines 5+; and column 3, lines 1-13 and 54-64.

16. Claims 1-5, 7, 9-11, 15-17, 20, 22, 23, and 29-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Stevens ('600).

Patentee discloses the production of fire resistant articles by coating particles, such as polystyrene or polyurethane foam scrap, with alkali metal silicate, which acts as a binder. The

alkali metal silicate meets applicant's intumescent material limitation. See abstract and columns 3 and 4.

17. Claims 1, 3-7, 10, 11, 17, 20, 22, 23, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Bloembergen et al. ('440).

Patentees disclose the production of a flame retardant insulating material, wherein cellular polymer particles and fly ash are combined with a polymer latex binder. See abstract and columns 2-5. Patentees specifically allow for the use of polymer particles containing flame retardants; therefore, applicant's limitation of claim 6 is met.

18. Claims 1-3, 5-7, 9, 10, 15-20, 22, 23, and 31-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Fracalossi et al. ('220).

Patentees disclose the production of flame retardant polyurethane foam, wherein polyurethane scrap foam particles are coated with a flame retardant and bonded together with a foam forming polyurethane composition. See abstract and columns 4 and 5. The position is taken that the flame retardant inherently impregnates the polyurethane foam scrap particles.

19. Claims 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over DE 3115456 in view of Saunders ('850) or Olsowski et al. ('644).

DE 3115456 discloses the production of composite building panels, wherein foamed plastic particles, such as polystyrene beads, are coated with a fire resistant coating, such as a silicate, considered to meet applicant's intumescent material; the resulting coated particles are then mixed with a foamable polyurethane composition; the resulting composition then foams and cures between facing layers, such as foil. See abstract.

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20. The primary reference is silent regarding applicant's claimed layered or "gradient" structure; however, in the production of flame retardant structures or materials, it was known at the time of invention to concentrate the flame retarding materials or fire resistant materials at the surface of a structure, so as to form a more fire resistant surface or outer layer that provides greater protection to the core. This position is supported by the teachings of Saunders at column 2, lines 28-36 and Olsowski et al. at column 2, lines 13-16. Furthermore, the use of incombustible, inorganic hollow microspheres as filler materials within insulating polyurethanes was well-known at the time of invention. Accordingly, the position is taken that since it was known at the time of invention that improved flame retardant composites can be obtained by concentrating the flame retardant materials or incombustible materials, such as microspheres, at the surface of the structure to be protected, it would have been obvious to the skilled artisan to produce analogous structures using layers, wherein the surface layers are optimized in terms of flame retardant characteristics, so as to obtain composites having an improved level of fire resistance.

Any inquiry concerning this communication should be directed to R. Sergent at telephone number (571) 272-1079.



**RABON SERGENT**  
**PRIMARY EXAMINER**

R. Sergent  
March 31, 2007